LEAN 101

Using Measurement - ChangeOver Time

CHANGEOVER: *The time from when the last good item/piece comes off a machine or out of a step until the first good item/piece of the next service/product is made. Changeover time includes set up, warm up, trial run, adjustment, first-piece inspection, etc.*

Changeover Time is the amount of time it takes to change over equipment/programs/ files/documents from the end of the previous step to the beginning of the current step.

STATE OF MAINE
DEPARTMENT OF HEALTH AND HUMAN SERVICES

Lean 101 - Changeover Time

Lean = A good product at the right speed.

Changeover Time is the amount of time it takes to change over equipment/programs/files/people from the end of the previous step to the beginning of the current step. Changeover time includes set up, warm up, trial run, adjustment, first item/work inspection, etc. Examples include: Creating a new file for a new customer; Reviewing an existing file before seeing a client; Changing computer programs; and Searching your desk for the correct form.

Changeover and Setup times are important factors in *Lean* thinking and implementation. Changeover is the total of Set-up time and Run-up time. Changeover can be the time and make the difference between a good product and a good product at the right speed.
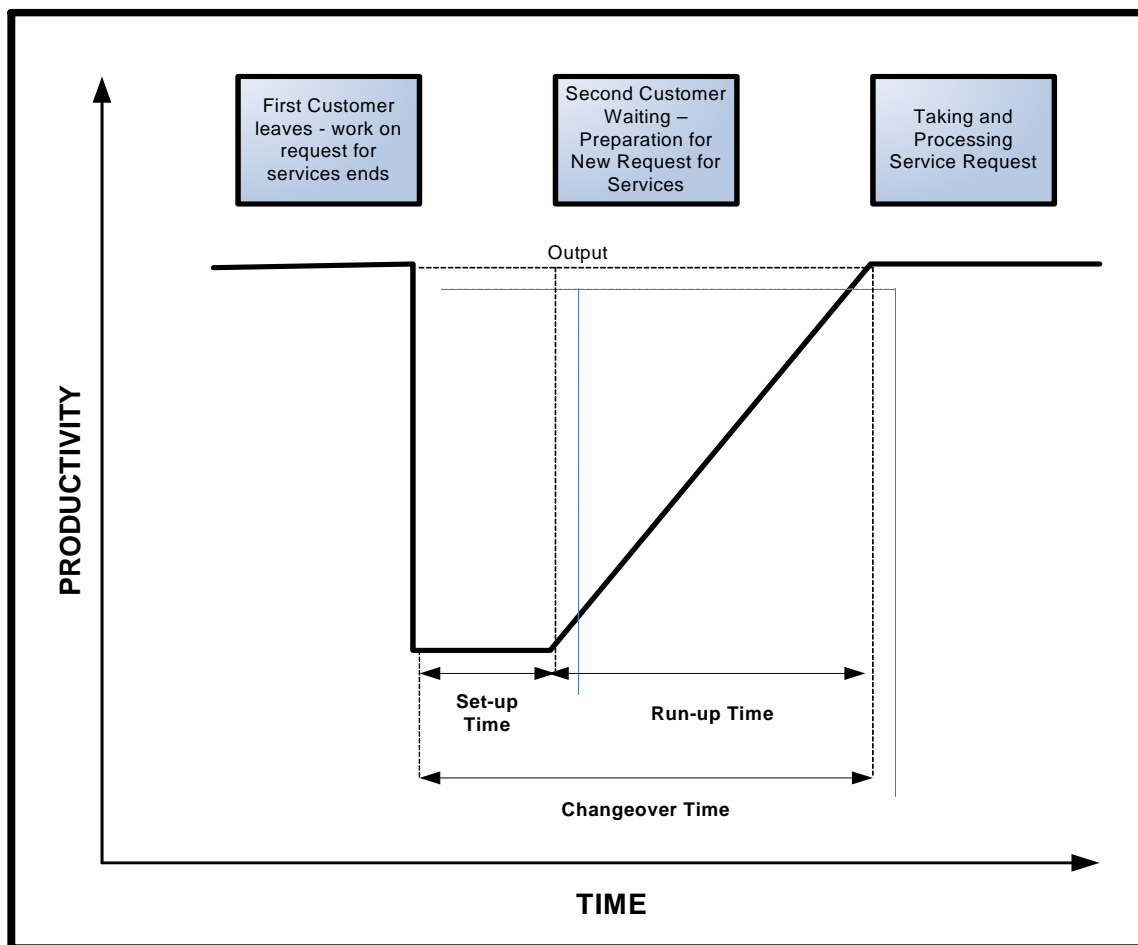
* Based on *Improving Changeover Performance*. R.I. McIntosh, S.J. Culley, A.R. Mileham, and G.W. Owen. 2001.

Using a service request process as an example, **Setup Time** refers to the time taken to make the changes to the actual work itself (papers/files/ equipment/programs/people) in order to address the new service request/demand. **Run-up Time** is the time taken to make adjustments to the work in order to produce request packets of the specified quality at the specified speed. Both comprise Changeover Time.

Changeover Reduction

Changeover reduction simply refers to attempts to reduce the time taken to carry out the changeover process. In order to reduce Changeover, you must have a very clear and specific understanding of the purpose for the changeover tasks and what each changeover task actually accomplishes.

There are a number of potential gains to reducing the time taken to changeover in a process. These include:

1. Increased efficiency.
2. Reduced time to get service/product to customer.
3. Reduced supply (inventory) and related space requirements.
4. Increased capacity.
5. Reduced work in progress.
6. Lower costs.
7. Increased flexibility.
8. Increased quality.

SMED

The classic approach to changeover reduction and the techniques that can be employed to achieve it has traditionally been **SMED** (Single Minute Exchange of Dies in *A Revolution in Manufacturing: the SMED System*. Shigeo Shingo. 1985). Briefly, this includes:

MEASURE

Measure the current changeover times and record them in order to monitor improvement. (Often, simply measuring the changeover time – or any step/time -- can have a profound effect on improving it.)

SEPARATE EXTERNAL AND INTERNAL ACTIVITIES

"External" activities are simply the jobs/work that <u>can</u> be carried out while the step or process is continuing (e.g. getting ready for the next customer while the service packet for the last customer is copying, etc.). "Internal" activities are those jobs which <u>cannot</u> be carried out while the step/process is going on (e.g. interviewing the customer while completing a service request packet on the prior customer). By identifying and separating internal and external activities, the intention is to do as much as possible while the step/process is continuing.

CONVERT INTERNAL TO EXTERNAL ACTIVITIES

The next step is to try and convert some of the internal tasks into external tasks.

REDUCE THE TIME TO CARRY OUT INTERNAL TASKS

Of the remaining internal tasks that cannot be converted to external tasks, efforts should be made to reduce the time taken to carry out them out -- to eliminate, modify, or streamline the changeover tasks. This can include re-design of the forms, protocols, and requirements. Consider tackling no- or low-cost reductions first, but keep in mind that you must not lose your focus on implementing the other reductions.